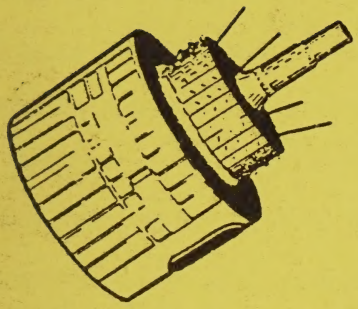
NEWSLETTER No. 12



REMOTE IMAGING GROUP

MARCH 1988

R E M O T E I M A G I N G G R O U P (R. I. G.)

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Editorial and Secretaries page

Well we didn't make it, this 'March' newsletter probably won't reach your doormat before the end of March. A basic lack of material from members and very heavy work commitments are the root causes.
The membership can always respond with more articles but my current professional commitments will continue at their current level for sometime.

On to matters new. The next in the series of NOAA satelites, NOAA-H will not now be launched till the 18 May or later due to problems with the AVHRR instrument. This information comes from the NOAA bulletin board via David Bailey, our USA connection. Another Russian satellite from the Meteor 2 series was launched successfully at the end of January, now called Met 2-17, and the European Space Agency are planning to launch Meteosat P2 in 15 April but currently I have no further details.

From our receiver manufacturers, Dartcom comes the news that they are unable to maintain the current price of their exxcellent receiver which with effect from this letter goes up by 12 pounds plus vat. This is the first price reflecting increased component costs since it was first introduced in June '86. The increase last year was purely for the introduction of vat.

Now on to a matter of increasing concern, the new paging frequency allocation immediately above the 137 MHz. The current operational systems, Racal Vodapage and Mercury paging use 138.075 MHz and 138.175 MHz respectively and are therfore very close to the frequencies used by the weather satellites. It is very unfortunate that the licencing authorities saw fit to allocate terrestial transmitting licences so close to the band we use to receive signals from distant satellites.
The systems are being installed to give nationwide coverage so potentially a large number of our members could be affected. Our membership survey on the back of the renewal form will give us the measure of the problems our members are experiencing but as these systems are still being installed we may need to canvas again our membership later in the year. In the meantime I am delighted to say we have made contact with an engineering representative from Mercury who is an amateur and is interested in weather satellites. His initial letter is published in this issue. Since I have undertaken to coordinate the investigation of this problem I have blanked out the address and Tel. No. as I do not want members to complain directly at this time. The basic problem, (which Henry expands on in his section) is whether the new paging transmitters are radiating energy in the Wx. Sat. band or is it the ability of our receivers to reject strong local signals on adjacent frequencies.
... contd on page 12

CHAIRMANS REPORT.

Welcome to 1988 even if newsletter No 11 did turn up late for 1987. I am told that the subscription renewals for 1988 have been returned at an amazing rate. This is a great vote of confidence to us all on the committee. This newsletter I am told will not be as many pages as the previous one, but I hope you will not hold that against us because its the only way we can catch up with a semblance of a time table. We are also short of articles to publish so get those pens going and ensure that No 13 is back up to sync again. Our printer had a bit of trouble getting the staples into No 11 because there were so many pages. It also weighed rather heavy and was a bit on the border line for the post office. No doubt this time we will not have any trouble.

The Quad loop Yagi has arrived at the testing station at last, but only in the last few days so there are no results yet. I hope to have these next time, but no promises. Perhaps I can get the constructional details written up for a further newsletter. I might even get a few made up and priced, so if there is a market I can be ready for your orders. That will be a major achievement in itself but I shall have to learn to walk before I try running! I must also confess to not having taken some pictures for some time as I have yet, and I have still to give a talk on weather satellites in March. Those valuable spare hours just seem to evaporate before your very eyes and the night or weekends are gone before they even started. Removing all those sacred goodies, (junk to my wife) out of my old house (which has to be demolished) doesn't help. The trouble is I still have to find somewhere to put it--its just to good to throw out ! I shall soon be waist deep in it let alone knee deep ! Excuses aside, I still have to keep as many things going where possible, but I sometimes wish that I could stop the world just to catch up, but alas it doesn't work like that does it.

The 'modulatable' light source has been on my mind just lately. As there has not been any developments with Blue LED's I have done a few tests on a simple device. You could possibly call it an optical gate or modulator. It is just a loud speaker with a damaged cone but a good voice coil and mount. I carefully removed the remains of the cone. I then did measurements on the distance the coil would move both in and out. The total amount was quite large, but when driven by DC it didn't seem to move anywhere near as far, but at least you can push as well as pull. If the cone didn't move at a very high frequency it wouldn't sound very good, so without the cone it should be even better. These are all good points and deserve further research.

I was going mount a fixed blade to the loud speaker frame close to the middle of the voice coil, and glue a similar but light weight section to the voice coil itself. The fixed blade would need to have some means of adjustment, both sideways as well as up and down. This type of optical shutter is similar to the way sound tracks were added to the early movie films. The shutter on it's own doesn't do much but add a high intensity light, a few lenses and possibly an optical fibre and you have a basis for experimentation. It all takes time and just at the moment I do not have much to spare, but I have already said that!

The problem with 'interference' from new paging systems on 138 MHz does give me a great deal of worry, and I and the committee feel that this all needs to be done in a coordinated way. That way we get the most done possible to alleviate the problem, but I fear that it could be something some of our members will never be clear of especially if they operate close to one of the 300 or so series now being installed. Work is being done and our secretary is trying to assemble as many facts as possible. The main questions are:-

How far away is the transmitter?
What type of aerial are you using?
How well is it sited?
Do you use a pre-amp?
What type of receiver?

My only advice for the present is that pre-amps will only make the problem worse and if you can resite the aerial it might be possible to get a bit more attenuation between your aerial and transmitter. A useful guide is to try and get the unwanted signal below the 1-10 millivolts level depending on the characteristics of your receiver.

I know it is not a lot to offer but it might get a few of you out of trouble. If the transmitters are not clean, then even this will not be successful. I have heard that a paging system transmitter is not something a communication engineer looks forward to - there have been problems. The equipment on one system is manufactured by a well known, well established manufacturer I can only hope that their usually high specifications are in evidence in an equally high quality signal. Please keep us informed of your problems.

I am afraid that we haven't progressed any further with the Beginners guide, but miracles do take a little longer-no doubt we shall see more in later newsletters. We are also hoping to receive news direct from the horses mouth in future newsletters, but we shall have to see how that develops In the meantime I hope that the interference problem isn't too bad and that just once in a while we shall have a normal spring and summer.

It would be nice to have a few days even a week or to of fine weather, around the time we usually reserve for our summer holidays. Well a farmer would wouldn't he! We might be able to see ourselves or Mother Earth as she is.

Till then look after yourselves

Henry.

Living with the New Paging Systems

- Henry Neale

This is just a few notes on the problems some of you are now having with the paging systems being installed nationally. In an ideal world high powered transmitters would not be allowed near receivers either in distance or frequency, but alas these conditions do not exist. Unfortunately we have to endure transmitters otherwise we wouldn't have satellites to listen too! With all the pressure for even more radio systems, allocations have been eaten away gradually and steadily for quite a while now. In this hurly Burly World we can no longer hope for the quietness and solitude that we have experienced until now. These systems have to go somewhere, unfortunately there isn't much demand for a taxi service at the North Pole !

The pressure on the Amateur bands and elsewhere is always on. Fortunately the 136-138 MHz band is designated to the satellite service and there shouldn't be any ground base transmitters in the band. Outside this band allocations have been made to two new paging systems and like it or not we are going to have to live with them there ! In the following paragraphs I am going to use the Russian frequency of 137.85 MHz as the wanted signal and a nominal frequency of 138.1 MHz for these unwanted signals- a spacing of only 250 kHz ! We want to receive signals down to 0.1 micro volts or less, and the paging systems want to provide their users with as strong a signal as possible to counter act their being in poor locations such as cars, basements or in the centre of large dense buildings. Hence very strong signals and many transmitters to provide 100% coverage even saturated coverage.

These unwanted signals can be up to 100 millivolts or even more if you are in close proximity to the transmitter. A ratio of one micro volt to 100 millivolt is 60 db so 0.1 microvolt is 120 db. this is like listening to a microscopic signal when there is a transmitter only 250 kHz away in frequency but a million million times stronger ! yes 10 to the power of 12.

Now you can see the problem, what can be done ? Well the overall receiving system must be looked at, and possibly redesigned if necessary. If I can go through the system stage by stage, you might be able to pick up some hints on design criteria as they occur. Aerial-yes we all need one and no you cannot do much about it. My comments in the Chairmans report suggest that by resiting it you might reduce the unwanted signal by 10 db more or less by ensuring that something is in the way between the aerial and the transmitter such as a chimney or building etc. Perhaps you cannot do anything so on to the next stage.

If you are using a preamplifier it will make matters worse, either use less coax or better coax- low loss and manage without a pre-amp. We then come to the receiver itself. It was designed in the past to achieve the best possible signal to noise figure, but now the other design criteria exist changing these conditions. The block diagram on page might help. The RF stage couples the aerial to the mixer providing gain to overcome circuit losses and mixer losses and achieve as good a signal to noise figure as possible. Remember though it amplifies wanted and unwanted signal equally and the gain is generally in the 14 db range. 0.1 microvolts becomes 0.5 microvolts but also 100 millivolts becomes 500 millivolts- half a volt of RF- have you got a transmitting licence? The local oscillator stage I will assume good clean and stable with no birdies or spurii, not a small feat ! The signals then pass on to the mixer- there are several types, some active others give gain as well and this must be considered when working on the RF stage, others are passive and only give a loss, this also must be remembered for the RF Gain. In any case the loss or gain applies to the wanted as well as the unwanted signals. The mixer must be very linear, handling both strong and weak signals equally. The filters come next but these are at the intermediate frequency (probably 10.7 MHz) and 250 kHz spacing is a much larger difference frequency as a percentage and we can now do something about it. It should be possible using a very good filter to achieve 80 db attenuation of the unwanted signal and in itself it may clear many of you if your present problems. Filters come in many specifications but their main parameter to mention here is the SKIRT or stop band attenuation. To achieve these figures the filters have to be matched to the input and output closely. The slope is the attenuation curve close to the passband and affects inband signals close to the wanted ones say 25-50 kHz from the centre frequency. This doesn't affect us too much but the stop band or SKIRT attenuation does. If the unwanted signal is 80db attenuated it is still 40 db stronger than the unwanted signal add some more gain and another filter and the wanted signal is then 20 db above the unwanted one, not an ideal result but at least one you can hear. Everything must be well decoupled and earthed otherwise the signals will just leak through.

With good filters and good designs and layouts these figures should be achievable.
The transmitters themselves have to meet a specification of below 80 db attenuation for all unwanted emissions. If the transmitter is very close to you you will still be getting a strong signal but this time possibly on the satellite frequency. However good your receiver you cannot do anything about it. I haven't gone into side band noise from the transmitters as these are beyond our control. Unfortunately it will not be the first time to find a transmitter that gives out energy where it shouldn't. With a good receiver it should be possible to co-exist It is understood that Dartcom are already working on modifications but are looking for someone close to them with interference problems using one of their receivers - don't all rush at once ! I hope that these notes , hastily prepared, have been of some use to you and we will try to keep you informed of any progress that is made.

A few words from our membership secretary

Over the last few weeks, I've been busy dealing with all the membership renewals-many thanks to all of you who renewed so promptly. My task was made much more interesting by all the additional information on interface, what you liked and disliked about the newsletter, description of your equipment and so on. A special thanks to those of you that included photographs and fax pictures of your endeavors!

Some of the renewal forms included requests for information. I will try to answer all these queries, but sadly the time I can spend on this is limited by my "real" work and so replies may be a little delayed. In particular, several RIG members have asked questions of the form:"Do you know of any other RIG members living close to me who are using the YU3UMV frame store?" Thanks to those wonders of computer technology, I can answer these questions (respecting those who have requested no publicity), but I'm not going to do so immediately.

Instead will wait a little until the majority of the renewals have arrived, and then the answer may be more useful. If any RIG member wants information of this sort for private use, please let me know. A SAE would be appreciated.

The analysis of the questionnaire will be postponed until most of the renewals have been processed, and so the results should appear in the next newsletter. The interference problem will, of course, demand very serious attention.

Des Watson.

A Simple V.L.F. Converter for 0-1000Khz.

by Adrian Nash, G4ZHZ.

Here is a simple VLF upconverter that allows you to receive excellent results with a reasonable HF receiver. I have built it so that I could receive press photographs and Meteosat sent out on VLF. There are other interesting and strange signals such as MSF atomic clock on 60kHz.

Q1 is a buffer amplifier which allows you to use just a short piece say 20ft of wire to receive VLF. It also provides the two stage low-pass filter (used to filter out the rest of the entire radio spectrum) with a high impedance load. The commonly available SBL-1 mixer module is used. I personally think that the passive type of mixer is better than active types for dynamic range and stability. Q2 forms a crystal oscillator. Choose an IF crystal that is a whole number of MHz. Fortunately most computer crystals meet this requirement and are so to be found in abundance. Thought should also be to the part of the short wave spectrum to be used for the IF. IF breakthrough can be a problem with some receivers. Although my prototype works on 4MHz and with my highly modified RCA AR88 gives excellent results, 16MHz might be better since there are not many strong transmissions in this part of the short wave band. L3 is an auto-transformer for impedance matching. Although the circuit will work without L3 being resonated, it is a good idea to resonate it at the IF to ensure rejection of unwanted frequencies. There is no filter on the output of the DBM because a reasonable HF receiver should give very good rejection of the unwanted 'f1+f2' product.

I have found the performance of the circuit very good, though a lot of the performance depends on the quality of the HF receiver. I have managed to pick up the mains on it using a 200Hz crystal filter on the HF receiver! Try touching the antenna in one hand and putting your fingers on the other hand near a light bulb (switched on).

This converter has a switchable low-pass filter giving cut-off frequencies of either 100kHz or 1000kHz. The 100kHz setting gives optimum results for signals at VLF.

Editors note

I will be producing a small single sided PCB for the upconverter in due course. Members who cannot wait for the next newsletter should send an sae to me marked VLF PCB for price details as soon as its available.

And here are some interesting frequencies to try:-

50Hz - the mains
14kHz - omega navigation system
16kHz - GBR at Rugby.
53.6kHz - RTO, Moscow meteo (90 RPM fax)
60kHz - MSF atomic clock at Rugby
106.8kHz - Prague meteo,OLT3.
111.8kHz - Prague meteo,OLT21.
117.4kHz - Offenbach Meteo DFC37.
119.9kHz - Norrkoping Meteo,SAY2.
122.5kHz - CF Halifax, NS,CFH.
125.2kHz - Kristinehamn Meteo, SLZ.
134.2kHz - Offenbach Meteo, DCF54.
139.0kHz - DPA Frankfurt, DFC39-PRESS Photos
198.0kHz - Radio 4 (GB)

All of the fax trasmissions except DPA, Frankfurt use +/- 150Hz FM modulation. However, with careful tuning, some reasonable results can be obtained, but of course an FM to AM converter is required if the YU3UMV frame store is to be used. (see VHF Communications, March 1985).

Meteosat re-transmissions can be received on 134.2kHz as follows:-
(z notation means GMT)

Daily Transmission time:	image	time of image:
0103z	IR Europe	0000z
0119z	IR Full disk	0000z
0200z	Experimental satellite image	
0315z	IR Europe	0230z
0643z	IR Europe	0600z
0942z	IR Europe 0900 or VIS Europe 0830	
1244z	IR Europe	1200z
1300z	VIS Europe	1200z
1523z	IR Full disk	1200z
1539z	IR Europe	1500z
1843z	IR Europe	1800z
2143z	IR Europe	2100z

Press photos can be received on 139.0kHz with great success. I use a modified Rank Xerox Telecopier 400 giving superb half-tone pictures.

HOW TO USE THE VERY LOW FREQUENCY CONVERTER.

Since there are very few adjustments to be made to the VLF converter, and it is a simple circuit, there is a very good chance that it will work first time providing the capacitors in the crystal oscillator are the correct value used.

Use good screened cable between the converter output and the HF receiver. A UHF PL 259 type plug connected to the end of a short piece of coaxial cable (connected in turn to the output of the VLF converter) will connect up to the UHF SO239 type socket found on many receivers.

For a VLF antenna, a long wire must be used. There is no such thing as a resonant dipole at VLF - it would be perhaps 15km in length! Fortunately, a much shorter length can be used, perhaps 10 feet or more would do. The high input impedance of the converter is ideal for connection to the end of a long piece of wire. In order to reduce the problems caused by unwanted pickup of such signals as television time bases, microcomputers, electric drills, vacuum cleaners (and the rest), make the feed point to the antenna as far away from buildings as practical, and use coaxial cable to connect the end of the wire through to the VLF converter. Connect the antenna wire to the inner conductor of the coaxial cable, and the outer sheath of the cable to the earthed socket of the converter input.

Apply 12-14v DC to power the converter. There is a diode to stop you damaging it by connecting the supply the wrong way round. The converter also includes a low power 12v regulator.

HF receiver requirements.
Given that you have got your VLF converter working (ie the crystal oscillator runs) and that it is connected up to the HF receiver as described above, what about how to receive the VLF converter signals?

Well, any receiver that will cover the converter crystal frequency and up to 1MHz above that, continuously, and has a beat frequency oscillator (BFO) for CW and a single side-band reception will do the job. Examples of suitable receiver are:- The Lowe HF125, the Tiro R600, R1000, R2000 or Yaesu FRG7, FRG7700 or FRG8800. I use a modified RCA AR88 which is about forty years old. If you are only interested in receiving long wave broadcast transmissions, then an AM only receiver will suffice, but where is the fun in picking up what you can already be received on any domestic radio?

The VLF converter will allow you to tune the received signals like any HF signals. If you have chosen a whole number of MHz for the crystal frequency for example, 4MHz, then tune your receiver to 4MHz plus the frequency in kHz that you wish to receive, so for 60kHz, tune the HF receiver to 4.060 MHz. Different signals require different I.F. bandwidths for proper reception. Many receivers have selectable bandwidths.

The following is a guide:-

Facsimile-ideally 4.4kHz for 120 RPM/IOC-576 signals. slower RPM's such as 60 or 90 RPM require less bandwidth as do signals using narrow deviation and/or IOC288. (see below)

Morse code-minimum bandwidth depends on speed of morse code. The narrowest bandwidth available could be used.

AM - eg Radio 4 -at least 4kHz, preferably 6kHz.

Time signal count as morse code.

As a matter of general, here is a list of bandwidths needed by various types of fax transmissions as may also be found in Guide to Fascimile Stations (Klingenfuss).

Helix speed	I.O.C.	Bandwidth
60	288	1704 Hz
60	576	2610 Hz
90	288	2158 Hz
90	576	3514 Hz
120	288	2610 Hz
120	576	4420 Hz
240	288	4420 Hz
240	576	8308 Hz

What else is down there ????

Most of the signals that you will receive below about 150kHz are strange sounds such as facsimile, time signals and sounds that somebody, somewhere must be able to decode but that most of us have no idea about !

Listen for thunderstorms on 9kHz. They also say that some of the strange atmospheric sounds of all are to be found between about 7kHz and 12kHz

On 100kHz there is a very strange wide-bandwidth "Woodpecker" sound. Various navigational systems use VLF, LF and MF. Omega is on 14kHz. Further up the frequency spectrum in the long wave and medium wave bands, you can here a great many marine and aero navigation beacons, each sending out its callsign in morse code regularly. These beacons only have a useful range of between 5km and 50km but they can often be heard 150km away. At 500kHz, many morse code signals from ships and coastal radio stations can be received.

Secretaries report - contd,

We should be able to report in the next newsletter the extent of the problem and what we believe we can do about it. Watch this space!

New Introductory booklet

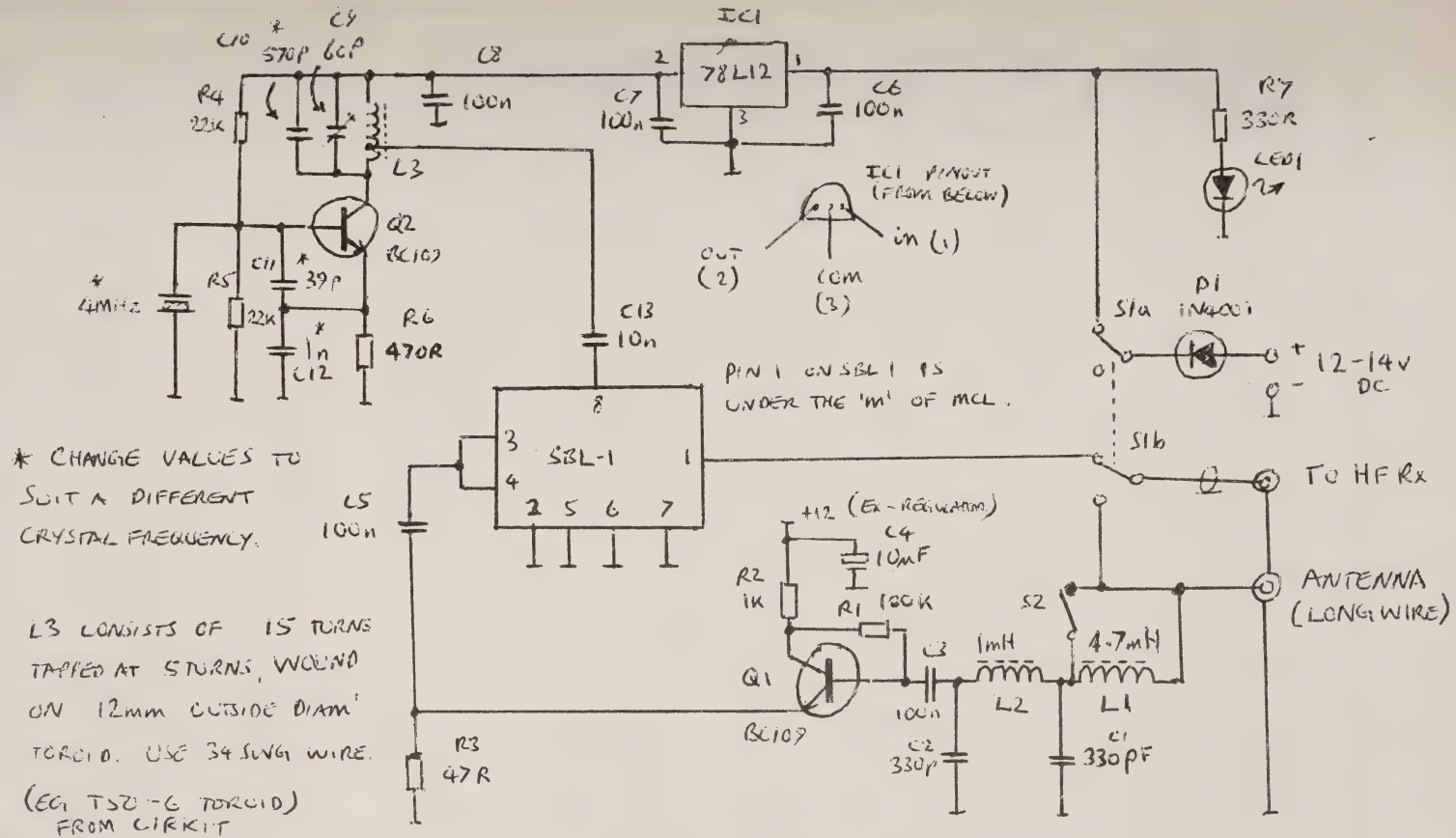
Mike Mansfield has produced a new introductory booklet on weather satellite imaging and whilst it does not have the depth of the corresponding book as advertised by Spacetech in this issue it is competitively priced at £2.20 and is available from the me. Cheques payable to 'RIG'.

Finally for those crossword fans the answers to the Christmas crossword are printed together with some explanations for some of the the more difficult clues.

Till next time,

May I wish you clear skies,

Phil, G8XTW



* CHANGE VALUES TO SUIT A DIFFERENT CRYSTAL FREQUENCY.

L3 CONSISTS OF 15 TURNS TAPPED AT 5 TURNS, WOUND ON 12mm OUTSIDE DIAM' TOROID. USE 34 SWG WIRE.

(EG: T50-6 TOROID) FROM CIRKIT

G4ZHZ's SIMPLE VLF CONVERTER

ADRIAN P. NASH

14/2/88

COMPUTER PROCESSING OF WEATHER SATELLITE PICTURES

by Dick Boardman

Most of the articles in this newsletter are concerned with how to receive signals from weather satellites. I am more interested in displaying and processing these pictures and I am writing this article in the hope of finding friends with similar interests. I receive pictures with a receiver and decoder made by TIMESTEP ELECTRONICS and display them on an ATARI ST microcomputer. The equipment was originally designed to work with a BBC Micro.

The picture sent down by a satellite is made up of a series of lines like a TV picture, but whereas a tv picture is made up of 625 lines sent 25 times per second a satellite picture is made up of a variable number of lines sent 2 per second. In both cases however, the line can be thought of as a spot of light, moving across a tv screen, varying in brightness. A picture is made by placing these lines exactly one above the other.

The easiest way to visualise how the pictures are made up is to think of the satellite as containing a mirror. This mirror is held at angle of 45 degrees to the satellites path and rotates about an axis which is tangential to the satellites orbit. The speed of rotation is 2 revs per second. Light from a spot on the earth travels up on to the mirror and is reflected on to a light sensitive device similar to a photographer's exposure meter where it generates an electric voltage. The brighter the light, the bigger the voltage. As the mirror rotates, the spot on the earth seen by the mirror moves in a straight line across the earth at right angles to the satellite's path till it reaches the edge. The mirror then turns right round and starts again when it sees the world again. In that time the satellite has moved a little so that the new line is alongside the previous one but a bit further round. Thus the side to side scanning motion is provided by the moving mirror and the up-down scanning motion is provided by the satellite's own movement.

The period of time when the mirror is pointing at the sky is filled with patterns containing either digital information, a second picture or signals to help calibrate the receiving system.

To re-create the picture we need to arrange for a spot of light to move in synchronism with the mirror and to vary in brightness with the voltage generated by the light sensitive cell. Photographic scanners do just this. They have a lamp which is mechanically scanned over a piece of photographic paper which is then developed into a picture.

To display the picture on a computer we need to arrange for a spot to scan across the computer screen in synchronism with the mirror, setting each point on the screen to the brightness seen by the light sensitive cell. A computer image is made up of a series of small dots (called pixels) and each dot has a limited range of brightness, hence we need to sample the signal once for each pixel, set it as near as we can to the right brightness, and have the computer remember each sample until the screen is full or the satellite is out of range.

Computers deal in numbers, not voltages, and so the last stage of the decoder converts the size of the voltage into a number, which the computer can work with. The computer also controls the time at which the sample is taken. On my computer, each line of the screen is made up of 320 pixels so, if I wish to display a complete picture I sample the signal 320 times in 1/2 second (the time taken for the mirror to make one revolution). The number I get is zero for a black dot and 127 for the brightest possible dot. If I do this for every line, the aspect ratio of the picture is wrong, eg England appears much longer in relation to its width than it would on a map. This is best corrected by sampling one line in eight on my system although it varies for different computers and different satellites. This gives a burst of 320 samples in 1/2 second followed by a gap of 7 1/2 seconds. To magnify part of the image, double the vertical scale by sampling one line in four and sample 320 points in 1/4 second and so on in proportion. My computer allows me to have up to sixteen different colours on the screen at any one time and I have chosen a set of sixteen different shades, starting with black, getting steadily lighter,and ending with white. The simplest way of choosing the colour of a pixel according to the number read is to set

0-7	black
8-15	colour 1
16-23	colour 2
:	:
:	:
120-127	white

and I use this as a first guess. However, once the whole picture has been collected, the quality of the picture can be enormously improved by re-allocating number ranges to colours. I will return to this later.

It is necessary to synchronise the start of the burst of samples to coincide with the start of a line. Otherwise you get two strips of picture, separated by a patterned strip produced by the digital data and calibration information.

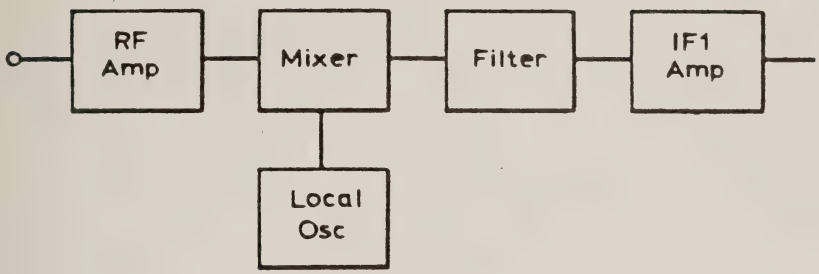
This can be done, either automatically or manually. The manual method is to have a key which temporarily alters the time between bursts of samples so that the picture drifts slowly across the screen until the required coverage is seen. The automatic methods have a device which looks for the 'start of line' signals which each satellite provides. These are different for each satellite. The automatic methods work well when the signal is strong but are less reliable at the start of the pass when the signal is weak. This is when they are needed most, hence most people I know use the manual method. Incidentally, my equipment is sufficiently accurate to maintain synchronism between passes so that if I set my equipment up on a distant, early, pass and leave it switched on, it is still correct at the start of the next pass.

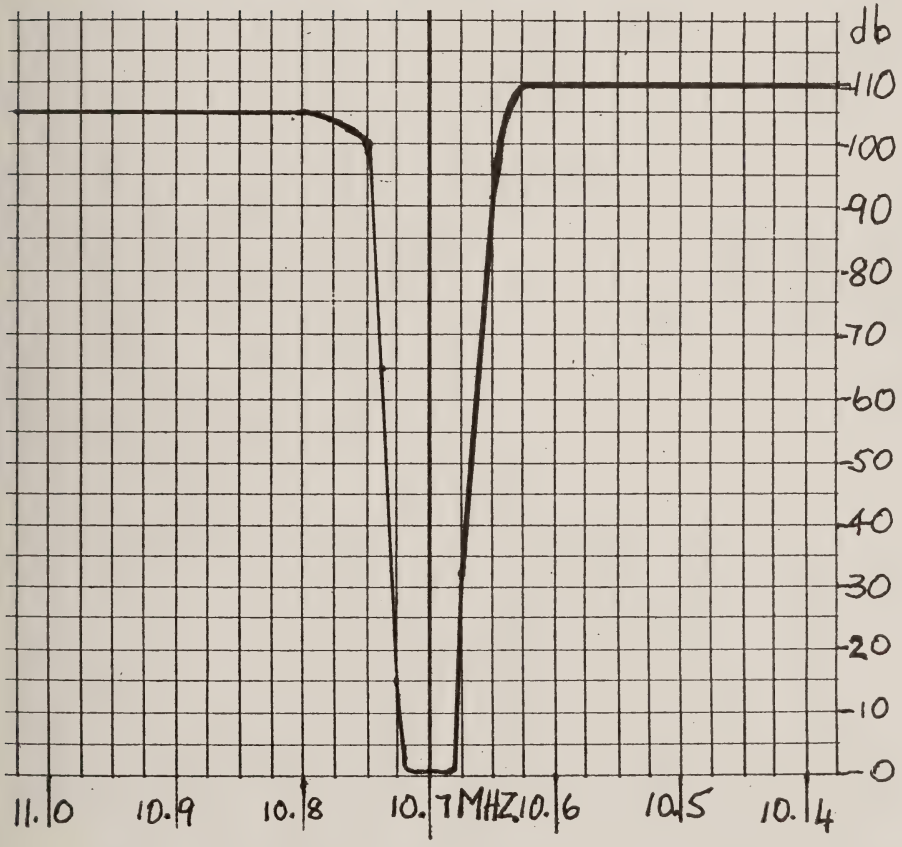
Once the start of line is fixed and the appropriate sampling interval chosen, the picture can be built up on the screen. This done by displaying a line at a time until the screen is full. On my computer I can scroll the picture down, removing lines from the bottom of the screen as fresh lines are added to the top until the satellite finally disappears over the horizon.

As well as displaying the satellite pass many people like to record it on a tape recorder. My receiver system supports this by offering a tape recorder output which includes a line from the squelch control which can be used to start and stop the tape recorder when a signal is present. However this has two disadvantages. Firstly, if the signal fades during the pass, the tape recorder will stop, leaving a gap in the picture and possibly a loss of line synchronisation when the picture is restarted. Secondly, if the tape recorder is left unattended in the hope of collecting the pass while the owner is away, the tape recorder is triggered by every burst of interference, and the tape rapidly fills up with rubbish. My solution is to control the tape recorder from the computer which gives me two possible methods of control. Either the computer can start and stop the recorder at the predicted start and finish of the pass, or, it can check that the signal really is from a satellite before starting the recorder and then waiting a full minute from the end of signal before stopping it.

Recognising the satellite signal is done by reading consecutive half seconds and comparing them using standard correlation techniques. If there is a high correlation the signal is probably from a satellite.

RECEIVER BLOCK DIAGRAM:





a very good crystal filter response

NOAA '9' PERIOD 102.0712121123372 MINS
INCR 25.51600845446735 DEG

1/04 183 03:59	30/04 332 13:58	31/05 348 15:05	30/06 342 14:42
1/04 336 14:11	1/05 330 13:47	1/06 346 14:54	1/07 186 04:18
2/04 334 14:00	1/05 355 15:29	2/06 190 04:31	1/07 339 14:31
3/04 331 13:49	2/05 352 15:18	2/06 343 14:43	2/07 183 04:07
4/04 353 15:20	3/05 350 15:07	3/06 187 04:20	2/07 336 14:20
5/04 351 15:09	4/05 347 14:56	3/06 340 14:32	3/07 333 14:09
6/04 348 14:58	5/05 344 14:45	4/06 184 04:09	4/07 331 13:58
7/04 345 14:47	6/05 188 04:22	4/06 337 14:21	5/07 353 15:29
8/04 189 04:24	6/05 341 14:34	5/06 181 03:58	6/07 350 15:18
8/04 342 14:36	7/05 185 04:11	5/06 334 14:10	7/07 348 15:07
9/04 187 04:13	7/05 338 14:23	6/06 332 13:59	8/07 345 14:56
9/04 340 14:25	8/05 183 04:00	7/06 354 15:31	9/07 189 04:32
10/04 184 04:02	8/05 336 14:12	8/06 352 15:19	9/07 342 14:45
10/04 337 14:14	9/05 333 14:01	9/06 349 15:08	10/07 186 04:21
11/04 181 03:51	10/05 330 13:50	10/06 346 14:57	10/07 339 14:34
11/04 334 14:03	11/05 353 15:21	11/06 190 04:34	11/07 184 04:10
12/04 331 13:52	12/05 350 15:10	11/06 343 14:46	11/07 337 14:23
13/04 354 15:23	13/05 347 14:59	12/06 187 04:23	12/07 181 03:59
14/04 351 15:12	14/05 345 14:48	12/06 341 14:35	12/07 334 14:12
15/04 348 15:01	15/05 189 04:25	13/06 185 04:12	13/07 331 14:01
16/04 346 14:50	15/05 342 14:37	13/06 338 14:24	14/07 354 15:32
17/04 190 04:27	16/05 186 04:14	14/06 182 04:01	15/07 351 15:21
17/04 343 14:39	16/05 339 14:26	14/06 335 14:13	16/07 348 15:10
18/04 187 04:16	17/05 183 04:03	15/06 332 14:02	17/07 345 14:59
18/04 340 14:28	17/05 336 14:15	16/06 355 15:34	18/07 190 04:35
19/04 184 04:05	18/05 333 14:04	17/06 352 15:23	18/07 343 14:48
19/04 337 14:17	19/05 331 13:53	18/06 349 15:12	19/07 187 04:24
20/04 182 03:54	20/05 353 15:24	19/06 347 15:01	19/07 340 14:37
20/04 335 14:06	21/05 351 15:13	20/06 344 14:50	20/07 184 04:13
21/04 332 13:55	22/05 348 15:02	21/06 188 04:26	20/07 337 14:26
22/04 355 15:26	23/05 345 14:51	21/06 341 14:39	21/07 181 04:02
23/04 352 15:15	24/05 189 04:28	22/06 185 04:15	21/07 334 14:15
24/04 349 15:04	24/05 342 14:40	22/06 338 14:28	22/07 332 14:04
25/04 346 14:53	25/05 186 04:17	23/06 182 04:04	23/07 354 15:35
26/04 190 04:30	25/05 340 14:29	23/06 336 14:17	24/07 352 15:24
26/04 343 14:42	26/05 184 04:06	24/06 333 14:06	25/07 349 15:13
27/04 188 04:19	26/05 337 14:18	25/06 330 13:55	26/07 346 15:02
27/04 341 14:31	27/05 181 03:55	26/06 353 15:26	27/07 190 04:38
28/04 185 04:08	27/05 334 14:07	27/06 350 15:15	27/07 343 14:51
28/04 338 14:20	28/05 331 13:56	28/06 347 15:04	28/07 187 04:27
29/04 182 03:57	29/05 354 15:27	29/06 344 14:53	28/07 340 14:40
29/04 335 14:09	30/05 351 15:16	30/06 189 04:29	29/07 185 04:16

All morning passes are southbound, afternoon passes are northbound.

Frequency 137.62MHz. INCRement is degrees change per orbit.

NOAA '10' PERIOD 101.2839020056245 MINS
INCR 25.32109245801291 DEG

1/04 194 08:33	29/04 343 18:32	29/05 178 07:31	28/06 190 08:19
1/04 346 18:41	30/04 186 08:02	30/05 173 07:09	28/06 342 18:27
2/04 188 08:11	1/05 180 07:40	30/05 198 08:50	29/06 185 07:57
2/04 340 18:19	2/05 175 07:18	31/05 193 08:28	30/06 179 07:35
3/04 183 07:49	3/05 195 08:37	31/05 344 18:36	1/07 174 07:13
4/04 177 07:27	3/05 347 18:45	1/06 187 08:06	1/07 199 08:55
5/04 172 07:05	4/05 189 08:15	2/06 182 07:44	2/07 194 08:33
5/04 197 08:46	4/05 341 18:23	3/06 176 07:22	2/07 346 18:40
6/04 191 08:24	5/05 184 07:53	4/06 196 08:42	3/07 188 08:11
6/04 343 18:32	6/05 178 07:31	5/06 190 08:20	3/07 340 18:18
7/04 186 08:02	7/05 173 07:09	5/06 342 18:27	4/07 183 07:48
8/04 180 07:40	7/05 198 08:51	6/06 185 07:57	5/07 177 07:26
9/04 175 07:18	8/05 193 08:29	7/06 179 07:35	6/07 172 07:04
10/04 195 08:38	8/05 344 18:36	8/06 174 07:13	6/07 197 08:46
10/04 347 18:45	9/05 187 08:07	8/06 199 08:55	7/07 191 08:24
11/04 189 08:16	10/05 182 07:44	9/06 194 08:33	7/07 343 18:31
11/04 341 18:23	11/05 176 07:22	9/06 346 18:40	8/07 186 08:02
12/04 184 07:53	12/05 196 08:42	10/06 188 08:11	9/07 180 07:40
13/04 178 07:31	13/05 190 08:20	10/06 340 18:18	10/07 175 07:18
14/04 173 07:09	13/05 342 18:27	11/06 183 07:49	11/07 195 08:37
14/04 198 08:51	14/05 185 07:58	12/06 177 07:27	11/07 347 18:45
15/04 193 08:29	15/05 179 07:36	13/06 172 07:05	12/07 189 08:15
15/04 344 18:36	16/05 174 07:14	13/06 197 08:46	12/07 341 18:23
16/04 187 08:07	16/05 199 08:55	14/06 191 08:24	13/07 184 07:53
17/04 182 07:45	17/05 194 08:33	14/06 343 18:32	14/07 178 07:31
18/04 176 07:23	17/05 346 18:41	15/06 186 08:02	15/07 173 07:09
19/04 196 08:42	18/05 188 08:11	16/06 180 07:40	15/07 198 08:50
20/04 190 08:20	18/05 340 18:19	17/06 175 07:18	16/07 193 08:28
20/04 342 18:28	19/05 183 07:49	18/06 195 08:37	16/07 344 18:36
21/04 185 07:58	20/05 177 07:27	18/06 347 18:45	17/07 187 08:06
22/04 179 07:36	21/05 172 07:05	19/06 189 08:15	18/07 182 07:44
23/04 174 07:14	21/05 197 08:46	19/06 341 18:23	19/07 176 07:22
23/04 199 08:55	22/05 191 08:24	20/06 184 07:53	20/07 196 08:41
24/04 194 08:33	22/05 343 18:32	21/06 178 07:31	21/07 190 08:19
24/04 346 18:41	23/05 186 08:02	22/06 173 07:09	21/07 342 18:27
25/04 188 08:11	24/05 180 07:40	22/06 198 08:50	22/07 185 07:57
25/04 340 18:19	25/05 175 07:18	23/06 193 08:28	23/07 179 07:35
26/04 183 07:49	26/05 195 08:37	23/06 344 18:36	24/07 174 07:13
27/04 177 07:27	26/05 347 18:45	24/06 187 08:06	24/07 199 08:54
28/04 172 07:05	27/05 189 08:15	25/06 182 07:44	25/07 194 08:32
28/04 197 08:46	27/05 341 18:23	26/06 176 07:22	25/07 346 18:40
29/04 191 08:24	28/05 184 07:53	27/06 196 08:41	26/07 188 08:10

All morning passes are southbound, evening passes are northbound.

Frequency 137.50MHz. INCRement is degrees change per orbit.

ANNUAL GENERAL MEETING

The Remote Imaging Group Annual General Meeting is being held at the SANDOWN RALLY on the 1st May 1988 at 3.15 pm in the "C" lecture stream. Anyone with specific items they wish to raise are asked to contact the HON SEC as early as possible.

LATE NEWS

NOAA H (11) launch has been delayed even further. It is now July 1988 at the earliest.

NOAA 9 is having problems with its power supply shunts. Its onboard power budget is having to be monitored very closely.

Once the pass has been collected it can be displayed and processed. My computer stores the whole pass, not just the bit on the screen so that I can scroll up and down the whole picture and choose what processing to carry out next. Possible options are:-

adjust the allocation of grey levels so as to get the best picture

superimpose a map.

edit out noise lines

To re-allocate grey levels it is necessary to store one byte per pixel, not just a picture. If this is done the next stage is to construct a histogram showing the number of times each value occurs in a given picture. In my case there are 127 possible different values so that my histogram has 127 values along the base and counts ranging from 0 to many thousands for each value. Typically, especially if the picture is very dark or very light, many values do not occur and frequently, using the simple colour allocation above, some colours are not used at all.This is obviously inefficient and it is obvious that if all colours were equally used the picture would contain much more information. The total number of pixels is known (call it P) hence for 16 colours the levels must be adjusted so that there P/16 pixels per colour. The way to achieve this is to start at zero on the histogram and add together the values in successive columns until the total is just greater than P/16. This will be the cut-off level for the first colour. Continue counting until the total is just greater than 2*P/16. This gives the cut-off level for the second colour: and so on for each colour. I use this scheme for displaying the infra-red pictures from the NOAA satellites and it extracts from a winter infra-red picture a level of detail comparable to a summer visible-light picture.

The picture sent by NOAA satellites is not what would be recorded on a photograph but has been 'linearised'. On a photograph the curvature of the earth would significantly foreshorten the sides of the picture: linearising makes the picture flat like a map. Hence to superimpose a map on to a satellite image I take the latitude and longitude of a series of points on the coastline and calculate the time at which the satellite would see them. Subtracting the start time of the picture gives the distance up the picture and the distance between the given point and the position of the satellite gives the distance across the picture. The position of the outline given by calculation is never quite exact because various errors so that my program allows the outline to be moved over the picture till it fits.

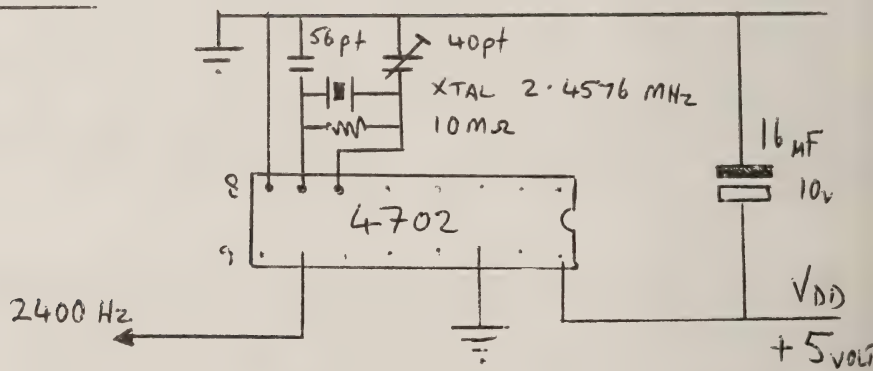
I have not managed to add a map to any Russian satellite because I have never had a picture with sufficient coastal outline to permit matching a map to it.

Like many members I suffer from interference which appears as line across the picture. Nothing can replace the information which has been lost but the appearance of the picture can be greatly improved by replacing noise lines by good lines from immediately above or below.

I hope these ideas will encourage more readers to display pictures with a computer and look forward to hearing what other readers do.

See Page 22.

CIRCUIT 2.



RUSSIAN SATELLITE CORNER by Les Currington

The winter months are not the best time to obtain good ground detail pictures for the dedicated viewer, but with the Russin Meteors you can be sure of any snow covered ground showing up in great detail.

During the fine spell in Febuary with very little snow over Europe the snow covered Alps and Pyrenees offered a good position indicator. The picture,shown on the centre page, of the storm on the 9th Febuary taken from the new Meteor shows the snow covered Alps and Pyrenees and illustrates the above points.

Meteor 2-14 86-39A 137.85 MHz

Good pictures are still being received but with the usual variations of contrast due to faulty exposure control: now in a very early orbit.

Meteor 2-15 87-01A 137.85 MHz

Now in a mid morning orbit with excellent pictures.

Meteor 2-16 87-68A 137.4MHz

Good pictures from a mid-afternoon pass.

Meteor 2-17 1988.05A 137.3MHz

At 22.30 on 31.1.88. James Brown heard a complete pass of I.R. pictures which were clearly recorded.This was a good indication that a new Meteor had been launched and after a quick modification to his scan converter he was able to get a picture of Europe. James Brown hops to reprint this picture to be included in a future copy of RIG This observation was soon verified by Geoff Perry who confirmed the of Meteor 2-17. Reports have been received from R Hogbern of Dover and Birgen Lindholm of Finland, both having reported receiving good pictures.

On Feb 17th I had my first view of Gulf of Bothnia from Met 2-17, like us in the U.K. this area had previously been covered with cloud. During the winter this part of Scandinavia gives excellent snow covered pictures and is always most interesting to watch. This Meteor is now in a mid-morning pass.

Cosmos 1602 84-105A Mhz 137.33 MHz ?

Several reports have been received that Cosmos 1602 has been seen on 137.33 MHz giving a short burst of pictures.

Cosmos 1869 87.62A 137.4 MHz

Nothing has been heard since late November when it was announced that the aerial array was faulty.

Meteor 30 80-31A 136.96 Mhz
Still giving good land and sea contrast in the late morning.

RIG are planning to attend the following rallies this year:

24 April	British Amateur Television Club rally at Post House Hotel, Crick, Just off M1 Junction 18
1 May	RSGB VHF Convention, Sandown Park Racecourse The RIG agm will be held in the afternoon
12 June	Elvaston Rally, Elvaston Castle Country Park nr. Derby
15-17 July	RSGB National Convention, National Exhibition Centre Near Birmingham
7 August	RSGB Mobile Rally, Woburn Abbey, BEDS

This weeks centrefold pictures come from James Brown, an enlarged picture of the UK from an earlier print we published and from Les Currington a picture from the just launched Meteor 2-17 showing the weather system that shook the south of England on February the 9th this year. The UK does not show up very well, it is in the middle of the image.

KEPLER ELEMENTS provided by Mary Finean
EARTH SATELLITE RESEARCH UNIT, UNIVERSITY OF ASTON

	MET 3-1 137.85 MHz 85-100 A	MET 2-17 137.XX MHz 88-05 A	MET 30 137.06 MHz 80-051
EPOCH OF DATA	8839.75410485	8839.84413849	8843.79598283
ACCELERATION	0.00000043	0.00000116	0.00001195
REV NO	11044	130	41814
INCLINATION	82.5496	82.5468	97.7129
R. A. NODE	225.3329	313.3328	134.2679
ECCENTRICITY	0.0020233	0.0015757	0.0043081
ARG OF PERIGEE	95.5576	213.6444	77.5144
MEAN ANOMALY	264.7869	146.3712	283.0893
MEAN MOTION	13.16925080	13.84016940	14.98723670
SEMI MAJOR AXIS	1.18780760	1.14911797	1.08973346

	COSMOS 1766 137.4 MHz 86-55 A	NOAA 9 137.62 MHz 84-123 A	NOAA 10 137.50 MHz 86-73 A
EPOCH OF DATA	8849.20526187	8845.17073885	8849.24067866
ACCELERATION	0.00000089	0.00000145	0.00000204
REV NO	8384	16345	7372
INCLINATION	82.5280	99.0852	98.6939
R. A. NODE	125.4283	18.2834	81.7545
ECCENTRICITY	0.0022298	0.0014632	0.0012757
ARG OF PERIGEE	234.5709	246.2967	214.0273
MEAN ANOMALY	125.3431	113.6670	146.0081
MEAN MOTION	14.73616203	14.11553089	14.22548369
SEMI MAJOR AXIS	1.10207201	1.13412460	1.12827685

	MET 2-15 137.85 MHz 87-001 A	MET 2-16 137.4 MHz 87-068 A	COSMOS 1869 137.4 Mhz 87-062 A
EPOCH OF DATA	8839.81546292	8839.54996971	8847.85925927
ACCELERATION	0.00000006	0.00000057	0.00000366
REV NO	5525	2412	3175
INCLINATION	82.4647	82.5535	82.5177
R. A. NODE	190.2376	251.3811	189.6262
ECCENTRICITY	0.0012744	0.0013032	0.0023123
ARG OF PERIGEE	200.5331	138.7138	315.2830
MEAN ANOMALY	159.5318	221.5017	44.6514
MEAN MOTION	13.83577893	13.83335986	14.73473452
SEMI MAJOR AXIS	1.14936070	1.14949492	1.10214312

TWO SIMPLE 2400Hz. GENERATORS.

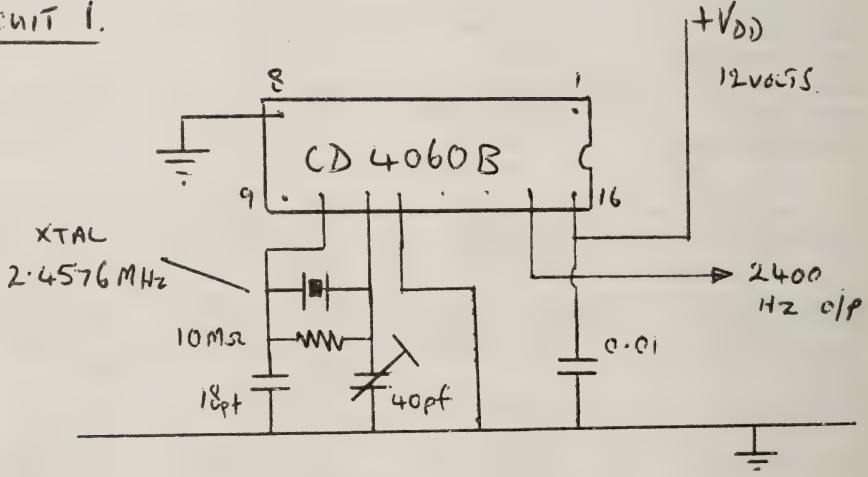
by Ivan Cline

Here are a couple of simple circuits using CMOS IC/s and a crystal. This is useful to enable one to lock up on the Russian Satellites by injecting this tone into Pt103 on YU3UMV board 001. I do this via a SPDT miniature switch, one side going to the output of the RX. and the other from this tone generator. Circuit 1 uses a oscillator and divider with a crystal of 2.4576 MHz. A small piece of veroboard is quite suitable to construct this on.

Circuit 2 I have included this also in case you might have this IC to hand. It is a 4701 baud rate generator from which one can obtain various tones out by combinations high or low of pin's 11,12,13,14. For our needs just pin 14 is taken low. Other components are more or less the same, the main difference seems to be in the prices. Quoting from a RS catalogue that I saw,4702 $7.20 4060 * £0.69. and the crystal * £2.75.

If you need a 2400 Hz source this should fill the requirements.

CIRCUIT 1.



CIRCUIT 2 IS ON PAGE 18.

Interfacing the YU3UMV framestore
to the IBM PC

From comments in the newsletter, it seems that there is a growing interest in the possibility of transferring data from the YU3UMV frame store to personal computers. The enclosed disk contains a program that I wrote a couple of months ago to enable me to input data from my frame store into my Tandon PCA20.

The PCA20 is an IBM-AT compatible with an 8MHz 80286 processor. Basically the program should work with any fully IBM PC compatible micro, but it might run out of breath at the higher line rates. Even on the PCA20 it cannot cope with x4 mode.

The program is in assembler, slightly untidy, but it works. I have put the source and an executable program on the disk. It might well need changing on other compatibles.

It makes use of the printer ACK interrupt. For this reason hardware compatibility with the IBM PC is necessary, otherwise the instructions to the 8259 interrupt controller will definitely not work. It also needs ANSI.SYS to be installed. However, this is only used to display the original screen message and it should be easy to mod the program to use a different screen driver.

The program works by using the printer status lines on the PC parallel printer port to input the serial data from the frame store. The lines used from the frame store are bit clock, pixel clock, line clock, serial data and ground. The pixel clock signal needs inverting. I used one buffer of a 74LS14 with a 4k7 pull-up on the output; one gate of a 74LS00 would do just as well. To use the program, make the connections to the printer port and start loading a picture to the frame store. When you wish to start saving a frame on the PC, run the program. When the program runs it counts on the screen the number of lines that have been read in. On reaching 256, the data is written in a file called FRAME.DAT and the program terminates. To exit the program at any other; time press CTRL-BREAK. There is a slight bug in that occasionally it crashes on pressing CTRL-BREAK, but at the moment it's got me beaten!

I have also put a batch file on the disk called FG.BAT, this enables you to name the file that is created, rather than being stuck with FRAME DATA. syntax is FG FILENAME.

The next question is what to do with the stored data! When I originally wrote the program, I also wrote another program to dump the picture onto an Epson LQ1500 compatible 24 pin dot matrix printer. If you are not familiar with 24 pin printers, they have a resolution of 180 by 180 dots per inch.

This seemed to offer good possibilities for synthesized grey levels. I was not happy with the results that I obtained - see example on next page - so I abandoned both programs, until I saw the various comments in the newsletter.

So there it is , I hope someone can make use of the program. It has obvious scope for cosmetic improvements-a variable picture size would be nice. I am more than happy to discuss it by letter or phone with anyone who has any bright ideas on what to do with the images once they are stored.

By the way, all the picture samples are, of course, Fax. I have designed and built a FAX to APT converter, so I can input FAX signals into the store. The pictures on the screen are absolutely superb, very much better than the print outs. The enhanced Meteosat and weather map are from Offenbach on 134kHz-my favorite FAX station. The other picture is from a news agency station about 138kHz. Unfortunately, like most of my projects, the converter is still on the bread board. If I ever get round to drawing out the circuit then I will send it to you.

INTERFACE CONNECTIONS.

Frame store			PC Printer Port	
Pixel clock	(Pt 115)	(invert)	ack	(pin 10)
Bit clock	(Pt 114)		busy	(pin 11)
Line clock	(Pt 124)		select	(pin 13)
Serial data	(Pt 113)		paper out	(pin 12)
Ground			ground	(pin 19)

73, Roger Barker, G4IDE.

Anybody requiring a copy of Roger's IBM PC software should send a 5.25" disc to the secretary together with adequate packing and stamps for return postage. The software is supplied by Roger on the strict understanding that it is not used for any form of commercial gain whatsoever.

Calgary 88

Members letters:

COLD TURKEY ! by Lawrence Harris

Just before Christmas I had a major antenna problem ! I have been using a Jaybeam crossed dipole which has not been an outstanding success. I had come to realise the limitations of my system which included a Dartcom receiver and pre-amp plus the roof mounted Jaybeam. I always got poor westerly reception despite having a perfect westerly horizon but had been using an additional wall mounted aerial when necessary, since the bad reception was linked to the roof antenna.

I wanted to replace the Jaybeam with another aerial and after many enquiries decide on the Timestep antenna from Garex Electronics. This seemed rather expensive at $70.00 or so but includes pre-amp and cable. I had initial problem with the cable which had a bad connection on one end but Mr Longhurst immediately replaced it and the aerial was then switched for the Jaybeam.

The first results were appalling ! I could only detect satellites that went above about 60 degrees ! Some discussion was held again with Mr Longhurst of Garex Electronics (who was being very fair and helpful more so than certain other companies that should be mentioned !) and he then sent me a small connecting box. Full of disbelief I sent up the box and was astounded with the results ! I now have virtually complete coverage limited only by the houses on my eastern side, and I can easily get good pictures at 2 degrees elevation on my western horizon.

Cold Turkey ? Have you ever gone 3 days without being able to see pictures from NOAA and friends ? All I could do during that time was to use my wall mounted dipole for a few western passes. And to make it worse friend Adrian (Brixham) rang me to tell me that cosmos 1602 had apparently come on for a few orbits !

Events had a happy ending as intimated. The Timestep antenna works surprisingly well when fitted with a capacitor to block the DC signal component. the supplied cable is UR76 which is rather lossy but the preamp gain of some 26 dB more than compensates for this, and of course there is no construction required. Do make a point of checking the unit all over before roof insulation !

With this new antenna I have broken all records for satellite monitoring. On January 1st I got an excellent picture from NOAA 10 at 2154z at 2 degrees elevation and similar results from other satellites. I picked up the new Met 2/17 a few days after launch and saw a superb view of Labrador land detail with Goose Bay crystal clear and Newfoundland easy, on the 4th February at 1550z

Meanwhile with the Jaybeam aerial down I looked carefully at the phasing harness and found a discontinuity in one of the sections. This had obviously been there since new but I did not know that it should have been checked. This should be noted for newcomers who maybe about to erect aerial systems. DO check the whole system at ground level before having the antenna mounted. I had checked it out but not with a meter, being new to the hobby. A call to Jaybeam soon rectified the situation and a replacement was sent which works perfectly.

There are many things happening on the Meteosat front which I monitor very closely but no doubt others will be detailing them. Could I enquire those with the capability might be willing to do some of the special projects such as the FM tape recorder circuit at reasonable cost for those like me who do not have the expertise ? A bit of a liberty perhaps but it would be very helpful!

Lawernce Harris

Dear Phil

Are there any members who have built the FM/AM Fax converter published in 'VHF Communications' and are successfully using it with the YU3UMV framestore?

I would be interested in hearing from anybody with experience of 'FAX and the frame store',

Thanks,

Trevor Smithers, G1SBS, 9 Pennine Close,
Foresters Park, Melksham, WILTSHIRE. SN12 7RX

MEMBERS ADS:

For sale -

A 12 inch Hitachi monitor in good working order	£50
A RIG petal dish, made up on a wooden frame	£25

David Jewson, Tel 0902 850033

Meteosat Downconverter - Fully described in RIG 8:-

a). Assembled and tested module in tin plate box:-
£129.69 + £1.00 p&p.

b). Complete mounted in weather proof box:-
£157.96 + £2.00 p&p.
Waterproof power and channel change connector £10.00 extra if required.

The RIG Receiver module is proving to be very popular with members and is still available from the secretary. The full specification was printed in RIG 5, but briefly the spec. is:

136 - 138 MHz Scanning receiver module
Sensitivity 0.2uV for 12 db SINAD at 10 kHz deviation
IF bandwidth 50 kHz
Audio tailoring specically designed for weather sats.

Built and aligned PCB together with
LED channel display module, Molex PCB connectors
and optionally, a full frequency LCD readout.

Basic module with channel display	£113.55
as above with additional LCD frequency display	£152.57

Prices includes packing and recorded delivery.
Cheques for above items payable to "DARTCOM".

The RIG VHF preamp also available includes a bandpass filter and is ideal for masthead mounting. The spec. was printed in RIG 7. It is available from the secretary as a built and aligned PCB measuring 85mm by 33mm (3 5/16 x 1 15/16 inches).

Module including first class post £13.37

Other items available by post:

A-D module for complete control of grey levels on the framestore £18.86

Cheques payable to "Remote Imaging Group" please

Anybody requiring PCBs should contact the secretary, G8XTW.

WHERE TO OBTAIN A RIG DISH and FEED HORN:

The RIG has had specially made, some 1 metre spun aluminium dishes and some compatible horn feed assemblies. These are intended to form the basis of an aerial system to receive signals form Meteosat II.

The cost of the dishes and feed horns has been kept to an absolute minimum. So they will not be available by any form of carriage as packing such an item would be impractical. So UK members only, sorry. They are only available to members who may only collect them from the despatch points below or from rallies we attend in the future.

When using the despatch points please use the telephone numbers given to reserve your dish and when collecting please pay by cheque payable to the "Remote Imaging Group".

1 Metre Spun aluminium dish for Meteosat	£34.00
Tubular feed horn with tripod mount for dish above	£33.73

Bedfordshire
The Editor/secretary, see front cover

Oxfordshire
Dermot, G8SIN, Tel. 0865 61797
22 Ramsey Road, Headington, Oxford.

Lincolnshire
Henry, G3REH, Chairman, see front cover

Devon
Dave, G4XOU, Tel 0822 613343
15 Milton Crescent, Down Park, Tavistock, Devon.

Sussex
Des, Membership Sec. Tel. 0273 813103

Manchester
John (J.M.) Horrocks G8GTP, Tel 061 766 6269
"Fairview", 17 Wood Grove, Whitefield, Manchester.

Hertfordshire
Les, G8LOK, see front cover

Birmingham
Colin Hall - see front cover.

Mercury paging

25th February 1988

Mr H Neal (G3REH)
Chairman
Remote Imaging Group
Thomlea
Fishers Gate
Sutton St James
Spalding
Lincs

Dear Sir,

I recently read with interest an item in your December Newsletter No. 11 concerning interference with satelitte reception by your members in the Little Birkhampstead area.

I would like to clarify a few misconceptions with that item. Mercury Paging Ltd have a National Area Paging licence issued by the DTI operating on a frequency of 138-1750 MHz. Our transmissions are FSK (4.5 KHz deivation) and not "square wave" as stated in your Newsletter. We are not the only users of this New Paging Band. Racal Vodapage operate on 138.0750 MHz and therefore the problem experienced by your Glasgow member of 138.08 MHz is more likely to have been caused by them. It is true to say that we are installing these transmitters Nationally and we will do everything we can to help and advise the group either directly of via the RSGB to minimise the interference caused. However, I would appreciate it if you could make the point to your members that MPL are not the sole user of this band and therefore may not be the cause in all cases.

With reference to your problem at Little Birkhampsted, if this is the only area that your members are experiencing problems, might I suggest that the problem may be one of reciprocal mixing between our transmitter and the BBC FM Broadcast site of Brookmans Park.

I understand that you have already established contact with John Hurst, Please don't hesitate to contact us if we can assist further.

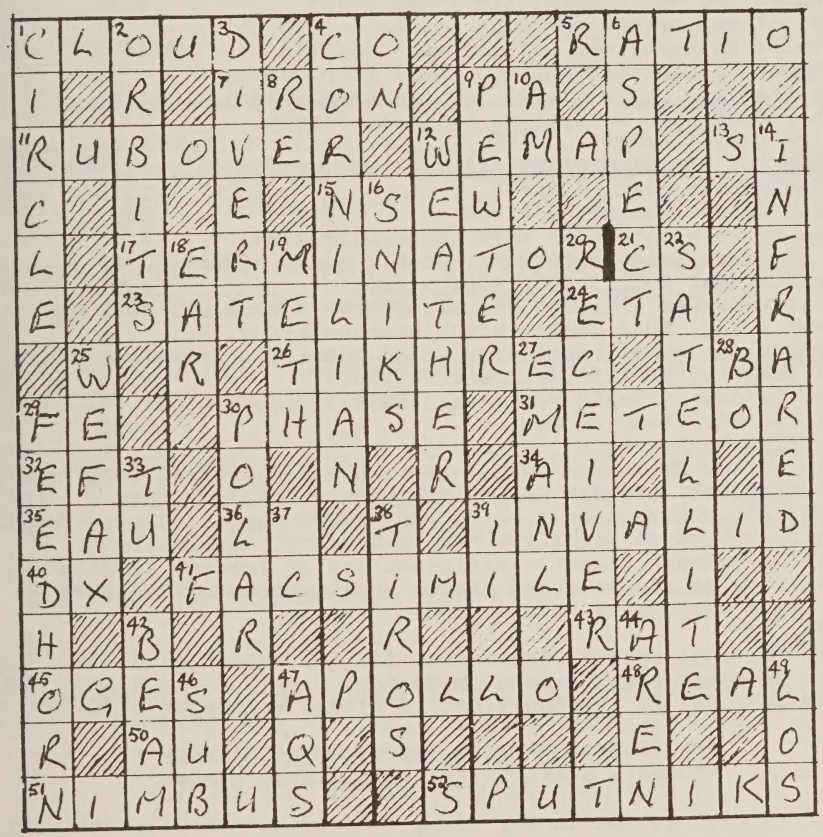
Regards,

Dave Toombs

Dave Toombs (G8FXM)
Network Manager

XMAS CROSSWORD ANSWERS
by Gordon Fleming, GOIIG

Congratulations to anyone who fully completed the Xmas crossward, particularly those of you whoe grasped the meaning of 32 across which was included to get you searching around for what DER WASSERMOLCH was appertaining to. In the Cambridge illustrated dictionary EFT is a definition for DER WASSERMOLCH a water monster. and the only thing I could find to explain EFT. Look for another crossword later in the year.


C L O U D C O R A T I O
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R U B O V E R W E M A P S I
C I E N S E W E N
L T E R M I N A T O R C S F
E S A T E L I T E E T A R
W R T I K H R E C T B A
F E P H A S E M E T E O R
E F T O N R A I L E
E A U L T I N V A L I D
D X F A C S I M I L E I
H B R R R A T
O C E S A P O L L O R E A L
R A Q S O
N I M B U S S P U T N I K S

WEATHER SATELLITE AND OTHER REMOTE SENSING PUBLICATIONS

My xyl has now been appointed as an authorised distributor for the National Remote Sensing Centre and can offer a members discount on some items. She has also negotiated a dramatic reduction in poster prices and these are now a very attractive buy. Please state that you are a RIG member when ordering and although most items are delivered from stock please give us your Christmas orders as early as possible. (Don't forget to show the list to your nearest and dearest!)

	PRICE memb.	non-memb.
BOOKS:		
Britain from Space. Colour Landsat Images & maps	11.95	12.50
Images of the World. Satellite image Atlas	12.30	12.95
Images of the Earth. Probably our best "glossy", Has to be seen. Various satellites + shuttle:	12.30	12.95
Sourcebook of Remote Sensing. Guide to products, facilities etc. Very useful for the enthusiast:	14.25	15.00
Weather Satellite Reception. by Chris Hornby. A Guide for Starters	8.75	9.75
POSTERS AND TEACHING MATERIALS. (All posters in colour.)		
Meteosat Whole disc. 400x600	1.75	1.75
British Isles. Landsat. 480x710	2.00	2.00
Europe by Satellite. NOAA HRPT. Superb. 590x780	2.50	2.50
Isle of Lewis. Landsat Thermal. Double sided. 660x810	3.00	3.00
London. Landsat colour. Spot your street!	4.50	4.95
Satellite images. (1 large, 6 small charts + booklet)	4.40	4.60
Satpack 1 & 2: NOAA images with interpretation. ea:	2.40	2.40
PRINTS: Colour gloss resolution up to 200million pixels per pic!		
Small (Landsat 195x250, Meteosat 215x200)	9.25	9.75
Large (Landsat 475x360, Meteosat 355x360)	18.50	19.50
Small framed: Black or oak	15.00	15.75
Large framed: As above.	25.50	26.95

(Whole disc. Hurricane David. British Isles, Ireland, Scotland: NOAA AVHRR, METEOSAT, Landsat GOES-E etc. Please ask for list)

VIDEOS: All videos £51.75 or £10.00(+10.00 dep. +1.00p&p) hire.
An Introduction to Satellite Remote Sensing. 35 minutes
Towards a Greener Planet. Interpretation of images. 20 minutes.
Remote Sensing, Coastal and marine applications. 20 minutes.
NRSC image processing, coming soon.

SLIDES:		
Remote Sensing: Coastal Processes. 18slides +booklet	8.50	8.95
Remote sensing: Applications in Geology	8.50	8.95
Remote Sensing: An introduction. 26 slides + booklet	9.50	9.95

POSTAGE & PACKING: £2.00 ON EACH ORDER
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Our full list is constantly being updated. Ring for latest list.

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Weather Satellite Kits & Systems

BBC MICRO-BASED WEATHER STATION

Comprising interface card and WXSAT software package. Used with the MSR20 receiver or similar, gives superb results at a realistic price! Some of the many features include:-

Zoom - X2, X4, X8
Greyscale Control - for visual or I.R.
User-defined colour palette
North/South picture invert facility
Printer dump for hard copies
Fast X-Y picture scrole
WEFAX compatible

The MSS20 can be assembled in an evening, and comes complete with test tape for easy instant alignment!

£3 buys you a demonstration disc of typical pictures (refundable). State 40/80 track.

[The MSS20 system offers really excellent performance, and should not be confused with other BBC-based systems from elsewhere which are no comparison].

£59.95 incl.

MSG20 HI-RES FRAME STORE

A 0.5Mbyte dual 512 x 512 frame store with powerful graphics capabilities. Software driven from BBC host micro (modular interface allows alternate host machines later) provides pictures as you've never seen them before. All the usual features like zoom, scroll etc., plus eight-picture capability at 256 x 256 pixel resolution! Due to backlog of orders please allow 28 days delivery.
Some of its many features include:-

* Zoom - x1 to x8
* Window Scrolling (in zoom mode)
* Disc dumping
* Post-Reception processing (PRP)
* Up to eight pictures in 256 x 256 mode
* Two pictures in 512 x 512 mode
* Modular design for WEFAX use
* Free software upgrades
* Contrast stretching/picture enhancement.

Price (built & tested module) £349 incl
DISCOUNT of 15% on all orders before 29/2/88

YU3UMV FRAME STORE KIT

All components to populate the PCBs (which are available from Phil. Seaford).

64k Memory £68.71 incl.
256k Memory £78.37 incl.

LOK SYNC BOARD KIT

A complete kit of parts to populate the PCB (available from Phil. Seaford)

£25.85 incl.

MSR20 VHF RECEIVER KIT

A high-performance, dual-conversion design optimized for low noise and high sensitivity. It incorporates audio mute, electronic channel switching, and facilities for the addition of channel scanners and S-meter.
Performance summary:-

RF Bandwidth (3dB)		2.5MHz
IF Bandwidth (3dB)		50KHz
IF Frequencies	(1st)	10.7MHz
	(2nd)	300KHz
Image Rejection Ratio		>100dB
Sensitivity (12dB quieting)		0.15uV
(fully ")		0.6uV
Supply Voltage		12v
Size		133 x 115 mm

The MSR20 is built onto a glass board with printed component overlay, and is accompanied by a comprehensive step-by-step instruction manual with layout and schematic diagrams.

£56.95 incl.

MSH20 RECEIVER HARDWARE KIT

A complete kit of parts to case and finish the MSR20. Includes metal case, mains transformer, switches, complete mains lead and IEC input socket, fuse, fuse-holder, knobs, rubber feet, screws, pillars etc.
Kit now also includes mains power supply components.

£14.30 incl.

MSA20 CROSSED-DIPOLE VHF AERIAL

A high-quality, well-finished, circular polarized custom-designed aerial. crossed-dipole elements with reflectors.

£24.95 incl.
with built-in preamplifier £39.95 incl.

MSK20 137MHz PREAMPLIFIER

A very low noise MOSFET preamp to give useful signal improvements where aerial-to-receiver runs of more than a few metres exist. The kit comes complete with diecast box and BNC connectors. It takes its power via the coaxial feed, avoiding the need for additional cable runs.

£10.95 incl.

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Post & Packing - please add £1.25 to all mail orders.

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